



**UGANDA COMMUNICATIONS COMMISSION
STANDARD FOR PROGRAMME MAKING AND
SPECIAL EVENTS (PMSE) OPERATIONS AND
APPARATUS**

April 2019

Communication for All

TABLE OF CONTENTS

1.	INTRODUCTION	3
2.	AMENDMENT OF THE STANDARD	3
3.	OBJECTIVE.....	3
4.	INTERPRETATION.....	3
5.	APPLICABLE LEGISLATIONS AND REGULATIONS.....	4
6.	SCOPE	4
7.	APPLICABILITY AND EXCEPTIONS	4
8.	PMSE OPERATIONAL REQUIREMENTS	4
8.1	Authorisation.....	4
8.2	Apparatus associated technical requirements	5
8.3	Eligibility requirements.....	5
9.	STAKEHOLDERS RESPONSIBILITY	5
9.1	The regulator	5
9.2	Industry players (eligible entities).....	Error! Bookmark not defined.
10.	ENFORCEMENT	6
ANNEX 1:	UCC PMSE AND ANCILLARY APPARATUS OPERATIONAL REQUIREMENTS.....	7
Table 1:	Block edge mask range conditions applicable to wireless audio PMSE apparatus in the frequency-division duplexing (FDD) duplex gap of the 800 MHz band (821-832 MHz).....	14
Table 2:	Block edge mask range conditions applicable to wireless audio PMSE apparatus in the FDD duplex gap of the 1 800 MHz band (1 785-1 805 MHz) for handheld apparatus (e.i.r.p.).....	15
Table 3:	Block edge mask range conditions applicable to wireless audio PMSE apparatus in the FDD duplex gap of the 1 800 MHz band (1 785-1 805 MHz) for body-worn apparatus (e.i.r.p.).....	15
Table 3:	PMSE use categories	16

1. INTRODUCTION

Programme Making and Special Events (PMSE) covers radio applications used in Services Ancillary to Programme making (SAP), Services Ancillary to Broadcasting (SAB), Electronic News Gathering (ENG), Outside Broadcasting (OB) and applications used in meetings, conferences, and other public or private events/gatherings.

There are three main groups of PMSE apparatus:

- audio PMSE - wireless microphones (handheld and body worn) and in-ear monitors;
- video PMSE – wireless apparatus used for video such as wireless camera;
- PMSE service links (used for transmission for production such as remote control and team connection).

PMSE stations typically use spectrum on secondary basis, that is, they must not interfere with other services or applications that use the spectrum on a priority or primary basis.

Uganda Communications Commission (UCC) wishes to prescribe the terms and conditions for use of PMSE apparatus in Uganda.

2. AMENDMENT OF THE STANDARD

This standard shall be subjected to periodic reviews to enable inclusion of any new developments resulting from the evolution within the sector, changes in policies and regulations as well as established good practice.

3. OBJECTIVE

The objective of this document is to define the operational requirements and conditions for use or operation of PMSE systems in Uganda.

4. INTERPRETATION

In this document, unless the context otherwise requires –

“Act” the Uganda Communications Act 2013 as amended from time to time

“Telemetry” is an automated communications process by which measurements and other data are collected at remote or inaccessible points and transmitted to receiving apparatus for monitoring.

“Communication services” means services performed consisting of the dissemination or interchange of audio, visual or data content using postal, radio or telecommunications media, data communication, and includes broadcasting.

“Apparatus” telecommunications apparatus” or “telecommunication station” means any apparatus or equipment used or intended to be used in connection with the transmission of communications by means of electricity from one place to another place either along a wire joining those two places

or partly by wire from each of those two places and partly by radio communication.

“UCC” means Uganda Communications Commission.

“Ancillary” is communication systems and apparatus that provide support to primary PMSE systems.

5. APPLICABLE LEGISLATIONS AND REGULATIONS

Section 5(1)(c) of the Uganda Communications Act 2013 requires the UCC to;

“to allocate, license, standardize and manage the use of the radio frequency spectrum resources in a manner that ensures widest variety of programming and optimal”

Section 25(1)(b) of the Communications Act 2013, exclusively mandates the UCC to;

“establishing technical requirements and standards in respect of—

- (i) Radio communications apparatus;
- (ii) interference-causing apparatus or any class of that apparatus”;

Section 3 (1) (a) of the Communication (Radio) regulations, 2005 states as one of the measures to achieve efficient use and management of radio spectrum resources is;

“Providing the widest possible range of wireless services to those who desire them, while maximizing the spectrum available to those who depend upon wireless technology in order to obtain maximum spectral efficiency”.

6. SCOPE

This document provides regulatory requirements and procedures for the operation of PMSE systems in the designated frequency bands in Uganda.

7. APPLICABILITY AND EXCEPTIONS

The provisions contained in this document are only applicable to operation of PMSE and ancillary system in the designated frequency bands.

8. PMSE OPERATIONAL REQUIREMENTS

8.1 Authorisation

To facilitate coordination with other users of the respective frequency band in a given geographical location, interested entities shall apply for authorisation from the UCC prior to the use or operation of any PMSE system and ancillary apparatus within Uganda.

An application for authorisation shall comprise:

- a) Submitting an application seeking permission to use radio frequency spectrum to operate such systems, clearly highlighting systems application category and the frequency bands of operation.
- b) submitting all technical data sheets/information pertaining to the apparatus of interest.

The application should clearly highlight the geographical area of operation and duration for which the permission is required.

All PMSE systems and ancillary apparatus shall be subjected to type approval prior to operation. This shall be done in accordance with UCC's type approval requirements.

Authorisation for a maximum of one year (renewable) shall to be granted to eligible entities that meet the UCC's requirements for the operation of such systems.

Applicants shall also be required to pay the associated fees as shall be specified in the UCC fees structure.

8.2 Eligibility requirements

Eligible entities are persons that have own PMSE systems and apparatus for use in Uganda.

Such persons are required to possess the following UCC requirements;

- i. A valid certificate of registration or incorporation of companies in Uganda.
- ii. A valid type approval certificate issued by the UCC.

8.3 Apparatus associated technical requirements

All PMSE and ancillary apparatus and operations shall conform to the technical specifications included in Annex 1, to ensure co-existence with other services in the designated frequency bands.

9. STAKEHOLDERS RESPONSIBILITY

9.1 The regulator

UCC shall be responsible for;

- i. Reviewing and updating the standard.
- ii. Enforcing adherence to the standard.

9.2 Owners and users of PMSE apparatus

- i. Seek authorisation prior to usage of any PMSE apparatus and systems within Uganda.
- ii. Ensure that all PMSE operations conform to the highlighted specification and any other conditions that may be highlighted.

10. ENFORCEMENT

In accordance with the Uganda Communications Act 2013, the Communication (Radio) regulations, 2005 and the Uganda Communications Commission Spectrum management guidelines of June 2017, the UCC shall impose fines to entities that unlawfully installs, connect and operates any PMSE and ancillary communications apparatus without due authorization. Further, the UCC may in accordance with the Act confiscate such apparatus possessed, installed, connected or operated unlawfully.

ANNEX 1: UCC PMSE AND ANCILLARY APPARATUS OPERATIONAL REQUIREMENTS

I. Wireless Audio Apparatus

Specifications applicable for systems/apparatus used in aiding projection of personal voice and music.

Minimum Requirements				
Frequencies or Frequency Band Edges (MHz)	Maximum Radiated Level ¹	Typical Channel Bandwidth	Notes	Reference Standard ²
175.150 to 175.350 175.425 to 175.625 176.300 to 177.100 184.500 to 185.100 191.600 to 193.100 199.600 to 201.100 207.600 to 210.100	10 mW ERP	200 kHz		EN 300 422-1 v1.3.2(2008-03) Electromagnetic compatibility and Radio Spectrum Matters (ERM); Wireless microphones in the 25MHz to 3 GHz frequency range: part 1: technical characteristics and methods of measurement.
470.000 to 703.000	10 mW ERP	200 kHz		
703.000 to 790.000	10 mW ERP	200 kHz	700 MHz band subject to clearance	
823.000 to 832.000	In accordance with highlighted Block edge mask range	In accordance with highlighted Block edge mask range		ETSI EN 300 422-1 V2.1.2 (2017-01) Wireless Microphones; Audio PMSE up to 3 GHz; Part 1: Class A Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
961.000 to 1015.000	10 mW ERP	200 kHz	Maximum channel bandwidth is 200 kHz	
1045.000 to 1075.000	10 mW ERP	200 kHz	Maximum channel bandwidth is 200 kHz	

¹ Radiated level may be increased to 50 mW ERP for transmitting apparatus designed to be worn in close contact with the body.

² Assumed to be fulfilled in frequency planning and definition of the apparatus type

1105.000 1154.000	to	10 mW ERP	200 kHz	Maximum channel bandwidth is 200 kHz
1785.000 1805.000	to	In accordance with highlighted Block edge mask range (tables, 1,2 &3)	In accordance with highlighted Block edge mask range	

II. Requirements for Talkback

These below specifications are applicable to Wireless apparatus/apparatus for telephony, for the purpose of communicating instructions instantly to all those concerned with a particular programme, particularly in videography. These include presenters, interviewers, cameramen, sound operators, lighting operators, engineers etc..

Requirements				
Frequencies or Frequency Band Edges (MHz)	Maximum Radiated Level	Typical Channel Bandwidth	Notes	Reference Standard ³
47.550 to 48.800 52.000 to 52.950	25 W ERP	12.5 kHz	For on-site use at temporary locations. Duplex Base Tx – 52 MHz band. Duplex Portable Tx – 48 MHz band.	ETSI EN 300 086-1 V1.3.1 (2007-12) Electromagnetic compatibility and Radio Spectrum Matters (ERM); Land Mobile Service; Radio apparatus with an internal or external RF connector intended primarily for analogue speech; Part 1: Technical characteristics and methods of measurement.
67.7500 to 67.8375	25 W ERP	12.5 kHz	For on-site use at temporary locations. Base Tx. Duplex with 75 MHz band.	
69.15625 to 69.18125	25 W ERP	12.5 kHz	For on-site use at temporary locations. Base Tx. Duplex with 82 MHz band.	
74.68125 to 74.71875	25 W ERP	12.5 kHz	Simplex.	

³ Assumed to be fulfilled in frequency planning and definition of the apparatus type.

UCC Standard for PMSE operations and Apparatus

75.26250 to 75.30000	5 W ERP	12.5 kHz	For on-site use at temporary locations. Portable Tx. Duplex with 67 MHz band.
76.80625 to 76.84375	25 W ERP	12.5 kHz	For wide-area use. Mobile Tx. Duplex with 86 MHz band.
78.18375 to 78.25875	25 W ERP	12.5 kHz	For wide-area or on-site use at temporary locations. Simplex.
82.65625 to 86.68125	25 W ERP	12.5 kHz	For on-site use at temporary locations. Portable Tx. Duplex with 69 MHz band.
86.6750	25 W ERP	12.5 kHz	
86.80625 to 86.84375	25 W ERP	12.5 kHz	For wide-area use. Base Tx. Duplex with 76 MHz band.
139.550, 139.575	10 W ERP	12.5 kHz	

Requirements for Talkback (continued)

Frequencies or Frequency Band Edges (MHz)	Maximum Radiated Level	Typical Channel Bandwidth	Notes	Reference Standard ⁴
139.64375 to 139.66875	10 W ERP	12.5 kHz		ETSI EN 300 086-1 V1.4.1 (2010-02) Electromagnetic compatibility and Radio spectrum Matters (ERM); Land Mobile Service; Radio apparatus with an internal or external RF connector intended primarily for analogue speech; Part 1: Technical characteristics and
140.98750 to 141.48750	25 W ERP	12.5 kHz	For wide-area use. Simplex and Duplex Base Tx. Duplex with 212 MHz band.	
148.575, 148.725	10 W ERP	25.0 kHz		
181.69375 to 181.80625	25 W ERP	12.5 kHz		
189.69375 to 189.80625	25 W ERP	12.5 kHz		
425.3125 to 425.5625	25 W ERP	50.0 kHz		

⁴ Assumed to be fulfilled in frequency planning and definition of the apparatus type.

UCC Standard for PMSE operations and Apparatus

427.7625 428.0125 442.2625 442.5125	to to	25 W ERP	12.5 kHz	For wide-area or on-site use at temporary locations. Simplex and Duplex.	methods measurement of
446.42500 447.51250	to	5 W ERP	12.5 kHz	For on-site use at temporary locations. Base Tx. Duplex with 467 MHz band.	
454.98750 455.47500	to	5 W ERP	12.5 kHz	For on-site use at temporary locations. Base Tx. Duplex with 468 MHz band.	
457.25000 457.47500	to	5 W ERP	12.5 kHz	For on-site use at temporary locations. Base Tx. Duplex with 467 MHz band.	
461.23125 461.25625	to	5 W ERP	12.5 kHz	For on-site use at temporary locations. Base Tx. Duplex with 468 MHz band.	
462.75000 463.0000	to	1 W ERP	12.5 kHz	For indoor use at permanent locations. Base Tx. Duplex with 469 MHz band.	
467.2625 469.8750	to	1 W ERP	12.5 kHz	For on-site use at temporary locations. Portable Tx. Duplex with 455, 457 and 462 MHz bands. For indoor use at permanent locations. Portable Tx. Duplex with 462 MHz band.	
470.000 606.000 614.000 694.000	to to	1 W ERP	25 kHz	For indoor use at permanent locations.	
694.000 790.000	to	1 W ERP	25 kHz	For indoor use at permanent locations.	

III. Requirements for Audio Links and Audio Distribution Systems (ADS).

Specifications applicable to wireless telegraphy apparatus for telephony, for the purpose of carrying broadcast-quality monophonic or stereophonic music and speech signals or for carrying multiple communications-quality talkback signals.

Requirements					
Frequencies or Frequency Band Edges (MHz)	Maximum Radiated Level	Typical Channel Bandwidth	Notes	Reference Standard ⁵	
48.425, 48.475, 48.525, 52.875, 52.925	10 W ERP	50 kHz	For temporary and permanent point to-point links.	ETSI EN 300 454-2 V1.1.1 Electromagnetic compatibility and radio spectrum matters (ERM); wide band audio links; part 2: Harmonised EN under article 3.2 of the R& TTE Directive	
48.300, 52.750	10 W ERP	200 kHz	For temporary and permanent point to-point links.		
53.750 to 55.750 60.750 to 62.750	5 W ERP	75 kHz	For portable links at temporary locations.		
60.750 to 62.750	1 W ERP	200 kHz	For Audio Distribution Systems.		
191.700, 199.700, 199.900, 200.100	1 W ERP	200 kHz	For portable links at temporary locations. Vertical polarisation only.		
425.3375, 425.3875, 425.4375, 425.4875, 425.5375	25 W ERP	50 kHz	For temporary point-to-point links.		
446.5125 to 447.5125					
454.9875 to 455.4750	25 W ERP	50 kHz	For temporary point-to-point links.		
467.2625 to 469.875	25 W ERP	50 kHz	For portable and temporary point-to-point links.		
470.000 to 606.000	5 W ERP	200 kHz	For temporary point-to-point links.		
606.700, 607.000	10 W ERP	200 kHz	For temporary point-to-point links.		
614.000 to 694.000	5 W ERP	200 kHz	For temporary point-to-point links.		
694.000 to 790.000	5 W ERP	200 kHz	For temporary point-to-point links.		

⁵ Assumed to be fulfilled in frequency planning and definition of the apparatus type.

1517.000 to 1525.000	20 dBW ERP	500 kHz	For temporary and permanent point-to-point links.	ETSI EN 300 454-2 V1.1.1 (2000-08) Electromagnetic compatibility and radio spectrum matters (ERM); wide band audio links; part 1: Harmonised EN under article 3.2 of the R& TTE Directive ETSI EN 300 630 V1.2.1 (2000-03) Fixed Radio Systems: point-to-point apparatus; low capacity point-to-point digital radio systems operating in the 1.4GHz frequency bands. ETSI EN 300 631 V1.2.1 (1999-12) Fixed Radio Systems: point-to-point apparatus; low capacity point-to-point digital radio systems operating in the 1.4GHz frequency bands.
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IV. Requirements for Wireless Cameras and Video Links

Specifications applicable for Wireless apparatus used in carrying broadcast-quality video together with music and/or speech signals.

Requirements

Frequencies or Frequency Band Edges (GHz)	Maximum Radiated Level	Typical Channel Bandwidth	Notes	Reference Standard ⁶
2.010 to 2.110	20 dBW ERP	10 MHz		ETSI EN 302 064 V2.1 Wireless video links operating in the 1.3GHz to 50Ghz frequency bands; Harmonised standard covering the essential requirements of article 3.2 of the directive 2014/53/EU
2.200 to 2.290	20 dBW ERP	10 MHz	Typically for low-power wireless cameras.	
2.290 to 2.300	0 dBW ERP	10 MHz	For low-power wireless cameras only.	
2.390 to 2.500	20 dBW ERP	20 MHz		
3.400 to 3.410	13 dBW ERP	10 MHz		
5.472 to 5.588 5.6825 to 5.7025 5.7050 to 5.7250 5.7325 to 5.7525 5.770 to 5.790 5.795 to 5.815 5.850 to 5.925	40 dBW ERP	20 MHz		
7.110 to 7.250	40 dBW ERP	10 MHz		
7.300 to 7.410	40 dBW ERP	10 MHz		
7.410 to 7.425	40 dBW ERP	10 MHz		
8.460 to 8.500	40 dBW ERP	20 MHz		
10.300 to 10.360	40 dBW ERP	20 MHz		
12.200 to 12.475 24.250 to 24.500	40 dBW ERP	25 MHz		
48.000 to 48.400	30 dBW ERP	100 MHz		

V. Requirements for Telemetry and Telecommand Links

⁶ Assumed to be fulfilled in frequency planning and definition of the apparatus type – compliance with which is not mandatory.

Data Application covers the wireless apparatus used in PMSE for data transmission such as Radio links for the remote control of cameras, Telemetry, and tele-command, signalling etc.

Requirements				
Frequency Band (MHz)	Maximum Radiated level	Typical Channel Bandwidth	Notes	Reference Standards
181.74375, 181.76875, 181.79375, 189.70625, 189.78125, 189.79375	10 W ERP	12.5 kHz		ETSI EN 300 113-1 V1.7 (2011-11) Electromagnetic compatibility and Radio spectrum matters (ERM); Land mobile services; Radio apparatus intended for the Transmission of data (and/or speech) using constant or non-constant envelope modulation and having an antenna connector; Part 1: technical characteristics and methods of measurement.
462.76875, 462.85625, 462.93125, 462.98125	1 W ERP	12.5 kHz		
470.000 to 478.000	1 W ERP	25 kHz		

Table 1: Block edge mask range conditions applicable to wireless audio PMSE apparatus in the frequency-division duplexing (FDD) duplex gap of the 800 MHz band (821-832 MHz)

Frequencies below 821 MHz	821-823 MHz	823-826 MHz	826-832 MHz	Frequencies above 832 MHz
Out-of-block baseline limits	Guard band (for protection against	In-block limits		Out-of-block baseline limits

Out-of-block equivalent isotropically radiated power (e.i.r.p.) is – 43 dBm/(5 MHz)	interference from PMSE into terrestrial systems capable of providing electronic communications services (downlink))	— in-block e.i.r.p. of 13 dBm for hand-held audio PMSE apparatus. — in-block e.i.r.p. of 20 dBm for body-worn audio PMSE apparatus.	in-block e.i.r.p. of 20 dBm	Out-of-block e.i.r.p. is – 25 dBm/(5 MHz).
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Table 2: Block edge mask range conditions applicable to wireless audio PMSE apparatus in the FDD duplex gap of the 1 800 MHz band (1 785-1 805 MHz) for handheld apparatus (e.i.r.p.)

	Frequency Range	Handheld apparatus (e.i.r.p.)
Out-of-block	< 1 785 MHz	– 17 dBm/200 kHz
Restricted frequency range	1 785-1 785,2 MHz	4 dBm/200 kHz
	1 785,2-1 803,6 MHz	13 dBm/channel
	1 803,6-1 804,8 MHz	10 dBm/200 kHz, with a limit of 13 dBm/channel.
Restricted frequency range	1 804,8-1 805 MHz	– 14 dBm/200 kHz
Out-of-block	> 1 805 MHz	– 37 dBm/200 kHz

Table 3: Block edge mask range conditions applicable to wireless audio PMSE apparatus in the FDD duplex gap of the 1 800 MHz band (1 785-1 805 MHz) for body-worn apparatus (e.i.r.p.)

	Frequency Range	Body worn apparatus (e.i.r.p.)
Out-of-block	< 1 785 MHz	– 17 dBm/200 kHz
	1 785-1 804,8 MHz	17 dBm/channel
Restricted frequency range	1 804,8-1 805 MHz	0 dBm/200 kHz

Out-of-block	> 1 805 MHz	– 23 dBm/200 kHz
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Table 3: PMSE use categories

Type of Activity	Included Purposes	Excluded Purposes
Production of a Television or Radio Programme, either at a permanent Studio or a temporary location, - whether or not it takes place at a public or private event.	Radio facilities directly involved in the production or control of the Programme material. As required for the holding, managing, running and termination of the event at the event location and site management, the following activities or personnel: ✓ Management staff ✓ Contractors' staff Security ✓ First Aid (in both cases, excluding any Safety of Life purpose) ✓ Catering ✓ Crowd marshals ✓ Traffic marshals ✓ Car parking ✓ Barriers and Signs ✓ Construction Maintenance ✓ Co-ordination with emergency services or local authorities.	Advertising
Public or private events, at any location, e.g Sporting Music Theatrical Religious Political Hobby Corporate Retailing - whether or not the event is to be broadcast.	Radio microphones. Communications provided for exclusive use of participants. (Incidental reception of these channels by the public is permitted, subject to the agreement of the licensee) Vision and sound links for distribution to loudspeakers or video screens, and for public address. As required for the holding, managing, running and termination of the event at the event location and site management, the following activities or personnel: ✓ Management staff	Advertising Broadcasting for reception by audiences or the general public.

	✓ Contractors' staff ✓ Security ✓ First Aid (in both cases, excluding any Safety of Life purpose). ✓ Catering ✓ Crowd marshals ✓ Traffic marshals ✓ Car parking ✓ Barriers and Signs ✓ Construction Maintenance ✓ Co-ordination with emergency services or local authorities	
Linking of Programme material from one fixed site to another fixed site	Annual links (designated frequencies only) 30 day links (designated frequencies only) Occasional use tariff (all other frequencies where available)	Broadcasting for reception by audiences or the general public.
Audio Distribution System (ADS)	For direct reception by a closed user group within a small defined area, typically a sports stadium or conference hall, of audio content such as a referee's comments, conference translations, audio descriptions for the visually impaired etc. ADS licensees must also be in possession of a valid ADS-RSL Broadcasting Act license	Community radio station Radio restricted service (RSL)